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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/746,739	12/22/2000	Matthew B. Dubin	H17-25994	6889
128	7590	07/27/2004	EXAMINER	
HONEYWELL INTERNATIONAL INC. 101 COLUMBIA ROAD P O BOX 2245 MORRISTOWN, NJ 07962-2245			AKKAPEDDI, PRASAD R	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/746,739	Applicant(s) DUBIN ET AL.	
	Examiner Prasad R Akkapeddi	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2004.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-40 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 17 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Remarks, filed 05/21/2004, with respect to the rejection(s) of claim(s) 1-40 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Steffensmeier and Clarke.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 6-10, 12-14, 17-18, 22-23, 27-29, 31-32, 36-38 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steffensmeier (U.S. Patent No. 6,540,363) in view of Clarke (U.S. Patent No. 6,014,232).

As to claim 1: Steffensmeier discloses a tiled display apparatus (Fig. 1) comprising a plurality of display devices (10 a, b, c) wherein each display device is subdivided into a plurality of sections (10a, b, c) and each section is configured to display a sectional (portion) image (col. 2, line 26), a screen (S) and a plurality of lens assemblies (14), wherein the lens assemblies is optically coupled to each of the sections in the display devices to project the sectional (partial) image

displayed on that section onto the screen, and the plurality of lens assemblies are configured to merge the projected sectional images to form a single tiled image (Fig. 1) (Col.1, lines 45-60).

Steffensmeier currently discloses three projection channels.

Steffensmeier does not disclose the subdivision of the display devices into plurality of sections.

Clarke in disclosing an electrical device such as liquid crystal displays (col. 1, lines 6) and tiled displays (col. 3, line 58) discloses plurality of panels (10, 20, 30) each having sub-array of pixels (11) (Figs. 2 and 3). Clarke also teaches that an image for each pixel is produced (col. 4, line 24), hence making each pixel a section displaying a sectional image. Clarke also teaches that a micro-lens (42) is associated with each individual pixel (11) or section (col. 4, lines 16-18) and that the magnification of the micro-lenses (plurality of lens assemblies) is such that the output of the display is continuous (col. 4, lines 38-41). The merging the projected sectional images to form a single tiled image (continuous large image) is disclosed in (col. 5, lines 55-61).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the plurality of sections and plurality of lens assemblies as disclosed by Clarke to the plurality of display devices as disclosed by Steffenmeier in order to constitute an uniform image and the join between the sub-arrays can be eliminated (col. 1, lines 30-37).

As to claims 2-4: Steffensmeier discloses that each display device consists of liquid crystal display modules (flat panel) (20a, b, c), fluorescent display tube (17) (non-FPD), and rear projection displays.

As to claims 6-10: Steffensmeier discloses the screen comprises a rear projection screen (S) having a rear side and a front side, and wherein the sectional (portions) images are projected onto the rear side (col. 2, lines 22-37) and the tiled image (whole) is viewable from the front side (Fig. 1), each of the lens assemblies (14) includes a projection lens (21, 22) for projecting the respective partial image onto the screen and they appear symmetric (Fig. 1). The lens assemblies (14) may include one or more individual lenses, hence a doublet or triplet (col. 3, lines 23-25).

As to claims 12-14: Steffensmeier discloses that each lens assembly (14) also includes a bi-power lens (col.3, line 25) for focusing the respective sectional image onto the respective projection lens (14) and the projection lens of each lens assembly has an optical axis and the field lens of each lens assembly has the same optical axis (Fig. 1) (drawn as a line through the center). In Fig. 3, Steffensmeier shows the optical axis of the projection lens (14c) is oriented horizontal and the optical axis of the field lens is oriented in the vertical direction thus making the two axes different.

As to claims 17-18: Fig. 1 of Steffensmeier clearly shows that the magnification of the lens assembly is greater than 1 and enlarging the image is disclosed in (col. 3, line 26) such that the projected partial image on the screen is

larger than the corresponding partial image on the image display device. The merging of the images can clearly be seen in Fig. 1 and there are no dead bands. The gaps are eliminated as can be seen in Fig. 1.

As to claims 22-23 and 27: Steffensmeier discloses plurality of backlight assemblies (17), each backlight assembly optically coupled to one of the display devices (Fig. 2), and each backlight channel is configured to provide a separate backlight for one of the sections of the corresponding display device (Fig. 2).

As to claims 28-29 and 36: Since a device cannot be manufacturable without a method and since the method claims as recited do not contain any specific sequence of steps or any unique combination of steps. Hence the method of generating a tiled display is inherent in the disclosure of Steffensmeier and Clarke.

As to claims 31-32, 37-38 and 40: Steffensmeier and Clarke disclose an apparatus for generating a tiled display, comprising a plurality of display devices (12), a screen (S), means (controller) for subdividing each display device into a plurality of sections (11, Clarke), means (controller) for displaying a sectional image on each section of each display device, and means (14) for projecting the sectional image displayed on each section of each display device onto the screen with the projected images merged into a tiled image (Fig. 1). The projecting means includes means (14) for magnifying at least one of the sectional images so the projected sectional image on the screen is larger than the

corresponding sectional image on the display device (Fig. 1). Steffensmeier also discloses a means for distortion control (col. 2, lines 6-21).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the multiple sections and projection channels that projects substantially mutually exclusive portion of an image onto a display screen (col. 1, lines 46-49) thereby optimizes the image that is displayed (col. 2, lines 36-38).

4. Claims 5, 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steffensmeier and Clarke and further in view of Itoh et al. (Itoh) (U.S. Patent No. 6,337,724).

Steffensmeier or Clarke do not disclose that the display device is a CRT display nor does he disclose backlight channel includes a fiber bundle.

Itoh in disclosing a conventional art of a tiled display apparatus (100) discloses CRT display (Fig. 28), the backlight assemblies (50) includes a condenser (31) for concentrating light received from a light source onto the section and each backlight channel includes a fiber bundle (52).

The Examiner has considered the Applicant's arguments regarding the Itoh, but in view of these specific claims, these arguments are moot because the use of fiber bundles to couple light in the backlight assembly is quite common in these systems.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the specific configuration as

disclosed by Itoh to the device of Steffensmeier to provide an image display system wherein a large-scale image can be generated and thin enough to be utilized in a room at a house which is light weight and cost effective (col. 2, lines 25-43).

5. Claims 11, 15 –16 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steffensmeier and Clarke as applied to claims 1, 7 and 28 above, and further in view of Sheridan (U.S.Patent No. 5,777,782).

Steffensmeier or Clarke do not disclose the use of ball lenses or plastic lenses. Sheridan on the other hand, in disclosing a display system discloses the use of plastic ball type lenses (21) and an array of these lenses (Fig. 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the plastic ball lenses for lightweight, flexible displays (col.1, lines 60-64).

6. Claims 19-21, 33-35 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steffensmeier and Clarke and further in view of Schwarzenberger (U.S.Patent No. 6,128,054).

Steffensmeier or Clarke do not disclose the shifting of the image by the lens assembly.

Schwarzenberger on the other hand, in disclosing an apparatus for displaying an image discloses the arrays shift the given parts of the display area to form a viewable image of the whole display area in which the gaps between the neighboring parts of the image are less visible (abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the specific configuration disclosed by Schwarzenberger to the device disclosed by Itoh so that the gaps between the neighboring parts of the image are less visible than the gaps between neighboring parts of the display area (abstract).

7. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steffensmeier and Clarke and further in view of Zimmerman et al. (Zimmerman) (U.S. Patent No. 5,598,281).

Steffensmeier or Clarke do not disclose tapered light pipes for communicating light from a light source onto the section.

Zimmerman discloses such tapered optical elements (30) for a backlight assembly used in display devices.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the tapered optical elements (pipes) as disclosed by Zimmerman for an improved lighting/optical arrangement which provides an efficient, bright and uniform image of high contrast and is capable of being viewed over a wide viewing angle, while maintaining a narrow profile (col.1, lines 56-60).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 571-272-2285. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PRA

Prasad R Akkapeddi, Ph.D
Examiner
Art Unit 2871


ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800